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SOCIAL-PSYCHOLOGICAL RESPONSE TO WATER RESOURCE DEVELOPMENT AMONG A RURAL OHIO COMMUNITY GROUP: A LONGITUDINAL ANALYSIS

by

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Water resource development has been and will continue to be a significant developmental problem for rural community groups due to the ever-increasing demand for high quality water from numerous sectors of our society. Much research has been done relative to cost-benefit analysis to justify capital expenditures for watershed projects. Physical science feasibility studies have also been emphasized to determine the possibility of constructing large impoundment projects. An area of equal importance, but unfortunately not often extensively analyzed or incorporated into decision-making, is sociological evaluation of watershed projects. This paper reports the findings of a study designed to provide some insight into the social consequences of water resource development upon a directly affected community group in Central Ohio.

Rural Areas as Development Sites

Project construction involving land acquisition and subsequent forced relocation of population is most likely to occur in rural areas. Projects requiring large tracts of land are usually located in areas of relatively low population density where fewer people must relocate. Such projects are often in response to the needs of people in urban areas. The reservoir project evaluated in this study was developed in response to the water and flood control needs of a major urban center located nearby, and will serve the recreational needs of Central Ohio.

The major objective of the study was to analyze the impact of rapid exogenous[1] change on a rural community by studying affected individuals' social-psychological response to their changing community over time. The stimulus for the rapid change was a water resource development project, construction of which necessitated acquisition of approximately eight thousand eight hundred acres of private property, and forced relocation of approximately ninety families.

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[1]Exogenous change refers to change originating outside of the social system (rural community).

The research findings reported in this paper represent the third phase of forced relocation studies conducted by sociologists in the Department of Agricultural Economics and Rural Sociology at The Ohio State University and the Ohio Agricultural Research and Development Center. The first phase of the longitudinal study (Napier, 1971; 1972; 1974) was a comparative analysis of several community groups affected by water resource development. The second phase (Wright, 1972; Napier and Wright, 1974) was oriented toward the evaluation of forced relocation of population due to construction of a transportation research center. The present research was designed to provide a longitudinal analysis of a rural community group which had been previously studied during the first phase of the forced relocation study. The restudy of the selected community was conducted using the same research instruments and basic research design of the original study. Data from the initial study were used as a basis for comparison with regard to attitude changes that were hypothesized to occur over time.

For the purposes of the present research, the initial sample was designated the "Initial Shock" group, since the first study was conducted at a time when extensive community disruption was being felt (only two percent of the land needed for the project had been acquired). The second data collection period was designated the "Post Shock" group, since the data were collected after the land acquisition phase of the project was completed and the people had been relocated. The dam has been constructed and water is beginning to fill the area to be inundated. The Post Shock sample was obtained within the same delineated community boundaries as the Initial Shock sample, since the objective of the research was to analyze adjustment to the restructured community group.

Rural Development and "Confrontation" of a Rural Community

Bertrand (1966) discusses confrontation as a social process very closely related to social change: The initial reaction to rapid social change tends to be resistance, followed by slow adaptation and eventual acceptance. Bertrand bases his theoretical model on the assumption that "individuals and groups are continually being confronted with the necessity of adapting to new ways and ideas" (1966: 449). Adjusting to change that occurs at a relatively slow rate does not usually create stress. However, rapid change tends to have a disorganizing effect. When change is exogenously induced and implemented in a relatively short period of time, the components of the social system may not have time to accommodate the change, and an unstructured situation may result.

Utilizing Bertrand's macro-level model of confrontation, Napier and Wright (1974) expanded the theory and applied it on a micro-level. It was contended that in rural areas affected by land acquisition and forced relo-

cation of a relatively large number of community residents, the exogenous changes imposed by the larger scale societal system upon the smaller scale rural system would result in a confrontation situation. Smaller scale rural systems (communities) confronted by mass society would tend to resist the change initially if the change is perceived to be of sufficient magnitude and significance to be potentially disrupting to the community group. Exogenous change has the potential of community disorganization when it is rapid and threatens to change interactional patterns. Affected residents may perceive the consequences of the exogenous change as negative and threatening, and therefore develop negative attitudes toward the changing community. The initial negative attitudes may slowly be replaced by acceptance and adjustment to the restructured situation over time.

In the community[2] investigated, confrontation by the larger scale societal system was in the form of acquisition of private property by the United States Army Crops of Engineers, forced relocation of community residents, and construction of a lake which has inundated a portion of the former geographical area of the community. In addition to the land acquisition and forced relocation, construction of the lake within the geographical bounds of the community has the potential to generate far-reaching changes in the community. Residents may perceive the extent to which the recreational use of the lake may affect their community: An influx of transient population with different values, beliefs, attitudes, and modes of behavior. The possibilities of population growth of the area are enhanced by construction of the lake, and land for real estate development should increase in value. A change in the composition of the community may result from the relocation of community residents and the movement of new people into the area.

The confrontation model states that a possible initial response to rapid change is resistance. The initial research in the community (Napier, 1971) was conducted at a time when resistance would be expected to be at its highest, since the change had just been introduced into the community. Only two percent of the land acquisition had occurred at the time the initial shock sample was obtained. Individuals were facing personal disruption; relocated individuals were planning their moves; community members were facing possible fragmentation of their community group. Uncertainties over the future effects of the project's location in the community were high; the established social system was facing the need to restructure.

The data for the restudy were gathered approximately four years after Napier's initial study. Land acquisition for the lake and relocation of

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[2]"Community" was defined on an interactional basis, rather than along political boundaries. (See Munch and Campbell, 1963)

residents had been completed. The dam has been constructed and the inundation is rapidly advancing. The community has had time to restructure, and many of the uncertainties have been resolved. Affected community residents were expected to have modified their attitudes toward the changing community.

According to the confrontation model, any initial resistance would have given way to acceptance as adaptation takes place. Since attitudes in the initial shock group were found to be generally positive, it was hypothesized that positive attitudes toward the community would be enhanced over time. In a test of the confrontation model, it was hypothesized that community members would go through a process of accommodating and adjusting to the restructured community, and that as acceptance of the changes takes place over time, more positive community-related attitudes would emerge.

In order to test the major hypothesis, attitudes were chosen as the variables which would reflect the social-psychological response of the rural residents to the rapid changes taking place in their community. Five attitudinal variables were chosen for investigation:

1. Community Identification was defined as the "we" feeling shared by community members; a consciousness of unity or belonging among community residents. The following indicators of community identification were used: cooperative effort by community members, mutual trust among the community members, pride in the community, pride in membership in the community, and a sentiment of liking among community members.

2. Community Alienation was defined in terms of degree of personal adjustment and integration into the community. Alienation was characterized by feelings of powerlessness and self-estrangement from the community group.

3. Community Satisfaction was defined in terms of satisfaction with community services in general, and perception of whether the community services and facilities were adequate in meeting the needs of community residents.

4. Value Orientation was defined in terms of attitudes toward and commitment to change in the community. Traditionalism and modernism were used as the opposing poles of the value orientation continuum. Individuals with a traditionalistic value orientation were defined as those who would tend to resist change in their community and support maintenance of the status quo. Individuals with a modernistic value orientation were defined as those who would tend

to accept change in their community. Rapidity and frequency of change were the major components of the scale measuring value orientation.

5. Familism was defined in terms of frequency and intensity of interaction with members of the nuclear and extended family. Frequency of interaction refers to the number of times an individual interacts with or desires to interact with members of his family. Intensity of interaction refers to the type of interaction that occurs, whether it is personal or impersonal. A familistic individual would desire frequent and personal interaction with family members.

Methodology

The research design utilized in the study is presented below:

	First Study Initial Shock			Second Study Post Shock	
Relocated Group	R	X	O_1		O_2
Nonrelocated Group	R	X	O_1	R	O_2

R = Systematic random sampling
X = Stimulus
O = Observation

The relocated portion of the post shock sample was not randomly selected; all of the relocated group who had resettled within the delineated community boundaries were contacted by the researchers. The nonrelocated portion of the sample was drawn through a systematic sample of the affected area. The relocated portion of the sample was selected from names and addresses provided by the developmental agency. Only those individuals who had relocated within the delineated area were included in the analysis, since the primary objective of the research was to evaluate response to changes occurring within the restructured community.

The post shock sample consisted of eighty-nine subjects. Nineteen of the subjects had been relocated and seventy were nonrelocated; thirteen of the nonrelocated people had sold property to the developmental agency but had not been required to move.

The initial shock sample was selected by a systematic sample of thirty relocated and thirty nonrelocated residents of the delineated community. Likert-type additudinal scales were utilized in the measurement of the five attitudinal variables.[3]

Analysis of variance was utilized to determine the existence of differences between the initial shock and post shock groups with regard to the attitudinal variables. The following comparisons were made for each variable:

1. Total initial shock group with total post shock group;
2. Initial shock relocated group with post shock relocated group;
3. Initial shock nonrelocated group with post shock nonrelocated group;

The first three comparisons were made in order to determine attitudinal changes that were hypothesized to occur over time for the total group and for relocated and nonrelocated subgroups. A fourth comparison was made to determine if significant differences could be noted between the post shock relocated and post shock nonrelocated groups. This comparison was made to determine the effects of relocated status upon attitudes. The initial shock group had been analyzed by Napier (1971; 1972); the results of the initial study are presented in Table 5.

Findings

The findings basically demonstrate that the restructured community group possessed stronger commitments to the group after the project was completed than during the land acquisition stage of project implementation. In this respect the hypothesis that the restructured group would be more positively oriented to their community than during the disruption stages was consistently supported. The data revealed that the post shock group also differed from the initial shock group in terms of traditionalism. The post shock group was significantly more traditionalistic in their orientation than the initial shock group which suggests that the post shock group perceived that change was taking place more rapidly in the restructured community than in the community prior to the major disruptive forces. The summary findings for the attitudinal variables are presented in Table 1.

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[3]For an extensive discussion of the methodology used in the construction of the attitudinal scales, see Napier, 1971, 1972; Wright, 1974; Napier and Wright, 1974.

TABLE 1. Comparison of Initial Shock and Post Shock Groups For Selected Attitudinal Scale Scores: Summary Statistics For Analysis of Variance Findings

Attitudinal Scale		Initial Shock	Post Shock	F-Ratio (Degrees of freedom = 1 and 147)
Community Alienation	Sample Size	60	89	6.5*
	Mean	46.0	41.1	
	Standard Deviation	11.1	12.0	
Community Identification	Sample Size	60	89	9.0**
	Mean	45.2	48.2	
	Standard Deviation	6.1	6.0	
Community Satisfaction	Sample Size	60	89	3.8*
	Mean	17.4	19.0	
	Standard Deviation	4.5	5.0	
Traditionalism	Sample Size	60	89	10.7**
	Mean	19.4	22.5	
	Standard Deviation	5.3	5.9	
Familism	Sample Size	60	89	11.1***
	Mean	34.8	37.5	
	Standard Deviation	4.4	5.1	

*Significant at the .05 level.
**Significant at the .01 level.
***Significant at the .001 level.

Inspection of the mean scale scores for each group shows the following findings:[4]

1. Both the initial shock and post shock groups were not alienated from the community. In fact, both groups would be considered well-integrated. The post shock group was significantly more integrated than the initial shock group.

2. Both treatment groups were highly identified with the community; the post shock group was significantly more identified.

3. Both treatment groups exhibited a slightly negative to neutral attitude toward community services. The post shock group was significantly more favorable to the services than the initial shock group, but the mean score for the post shock group would be classified as neutral to slightly positive.

4. The post shock group tended to be slightly traditionalistic, while the initial shock group tended to be slightly modernistic.

5. Both treatment groups were highly familistic, and the familism was increased over time. The post shock group was more familistic than the initial shock group.

When the data were disaggregated into relocated and nonrelocated subgroups, the role of relocation status in the explanation of the differences which were observed in the two aggregated treatment groups (initial shock and post shock) could be observed.

The greatest source of the differences between the aggregated groups (Table 1) was in the nonrelocated groups. Inspection of Table 2 will show that the initial shock relocated group differ significantly from the post shock relocated group in terms of one variable (familism).

The post shock relocated group was significantly more familistic than the initial shock relocated group which is consistent with the aggregate group findings. The findings presented in Table 2 indicate that no significant differences were found between the treatment groups for the other variables.

Note should be made of the small sample size in the post shock relocated group. It is conceivable that the relatively small sample size could be a problem for the post shock relocated group, but the limited number of families that had relocated within the delineated boundaries precluded expansion of the sample size.

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[4]Refer to Appendix I for the range of possible scale scores.

TABLE 2. Comparison of Initial Shock Relocated and Post Shock Relocated Groups For Selected Attitudinal Scale Scores: Summary Statistics For Analysis of Variance Findings

Attitudinal Scale		Initial Shock Relocated	Post Shock Relocated	F-Ratio (Degrees of freedom = 1 and 47)
Community Alienation	Sample Size	30	19	1.7
	Mean	45.7	41.6	
	Standard Deviation	10.6	11.3	
Community Identification	Sample Size	30	19	2.0
	Mean	45.3	47.8	
	Standard Deviation	6.4	5.7	
Community Satisfaction	Sample Size	30	19	0.1
	Mean	18.2	17.8	
	Standard Deviation	4.3	5.8	
Traditionalism	Sample Size	30	19	0.6
	Mean	21.0	22.3	
	Standard Deviation	4.9	6.8	
Familism	Sample Size	30	19	4.1*
	Mean	34.5	37.2	
	Standard Deviation	4.5	4.6	

*Significant at the .05 level.

The data presented in Table 3 demonstrate that the post shock group differed from the initial shock group on all variables. The differences were consistent with the aggregate findings (Table 1). The data clearly demonstrate that the nonrelocated group modified their attitudes much more than the relocated group. It is interesting to note that the modifications were in the positive direction with regard to attitudes toward the community.

Table 4 presents the findings for the post shock group disaggregated into relocated and nonrelocated subgroups. The findings demonstrate no significant differences between groups, and the mean scores indicate positive attitudes. Traditionalism tended to be somewhat higher than modernism for both groups.

Summary of Attitudinal Findings

The major findings of the study were:

1. The community groups under study were more integrated (less alienated) at the time of the restudy than during the first data collection phase of the research.

2. The community group exhibited higher degrees of community identification at the time of the second data collection.

3. The community group was significantly more satisfied with community services at the second data collection time.

4. The community group tended to be more traditionalistic during the second time period of the study.

5. The community group exhibited higher degrees of familism at the second time period.

The findings are summarized in Table 5. A significant difference between time periods is designated by "s", while a nonsignificant difference is represented by "ns."

Summary

This study was a micro-level analysis of confrontation of a small scale social system (the rural community) by a large scale social system. Exogenous change was introduced into the community to serve urban needs. The long-term regional benefits will accrue especially to the urban sector. Individuals in the affected community have experienced the more immediate consequences of the exogenous change: Relocation of community members, disruption of services, and a restructuring community group.

TABLE 3. Comparison of Initial Shock Nonrelocated and Post Shock Nonrelocated Groups For Selected Attitudinal Scale Scores: Summary Statistics For Analysis of Variance Findings

Attitudinal Scale		Initial Shock Relocated	Post Shock Relocated	F-Ratio (Degrees of freedom = 1 and 98)
Community Alienation	Sample Size	30	70	4.1*
	Mean	46.3	40.9	
	Standard Deviation	11.8	12.2	
Community Identification	Sample Size	30	70	6.0*
	Mean	45.1	48.4	
	Standard Deviation	6.0	6.1	
Community Satisfaction	Sample Size	30	70	6.6**
	Mean	16.6	19.3	
	Standard Deviation	4.6	4.8	
Traditionalism	Sample Size	30	70	15.3***
	Mean	17.8	22.5	
	Standard Deviation	5.2	5.7	
Familism	Sample Size	30	70	5.0*
	Mean	35.1	37.6	
	Standard Deviation	4.3	5.2	

*Significant at the .05 level.
**Significant at the .01 level.
***Significant at the .001 level.

TABLE 4. Comparison of Post Shock Relocated and Nonrelocated Groups for Selected Attitudinal Scale Scores: Summary Statistics For Analysis of Variance Findings

Attitudinal Scale		Post Shock Relocated	Post Shock Nonrelocated	F-Ratio (Degrees of freedom = 1 and 87)
Community Alienation	Sample Size	19	70	0.04
	Mean	41.6	40.9	
	Standard Deviation	11.3	12.2	
Community Identification	Sample Size	19	70	0.1
	Mean	47.8	48.4	
	Standard Deviation	5.8	6.1	
Community Satisfaction	Sample Size	19	70	1.3
	Mean	17.8	19.3	
	Standard Deviation	5.8	4.8	
Traditionalism	Sample Size	19	70	0.02
	Mean	22.3	22.5	
	Standard Deviation	6.8	5.7	
Familism	Sample Size	19	70	0.1
	Mean	37.2	37.6	
	Standard Deviation	4.6	5.2	

TABLE 5. Summary of Analysis of Variance Findings For Five Attitudinal Variables

Groups Compared	Alienation	Identification	Satisfaction	Traditionalism	Familism
Total Initial and Post Shock	s P.S. less alienated	s P.S. more identified	s P.S. more satisfied	s P.S. more traditionalistic	s P.S. more familistic
Initial Shock and Post Shock Relocated	ns	ns	ns	ns	s P.S. more familistic
Initial Shock and Post Shock Nonrelocated	s P.S. less alienated	s P.S. more identified	s P.S. more satisfied	s P.S. more traditionalistic	s P.S. more familistic
Initial Shock Relocated and Nonrelocated	ns	ns	ns	s Relocated more traditionalistic	ns
Post Shock Relocated and Nonrelocated	ns	ns	ns	ns	ns

In a test of the confrontation model it was hypothesized that response over time would indicate acceptance of the changes as evidenced in attitude change of the affected group. The findings of the present research indicate that the post shock group, when compared with the initial shock group, was less alienated, more identified with their community group, more satisfied with their community, more traditionalistic, and more familistic.

Adjustment, or "a state in which one modifies his attitudes to accommodate a newly encountered situation" (Napier, 1971: 6), appears to have occurred in the affected group, as evidenced in the significant increase in community satisfaction, community identification, and nonalienation (integration into the community group).

The post shock group exhibited a greater traditionalistic value orientation, and were apparently committed to the maintenance of the restructured community. Having experienced the effects of rapid exogenous change in their community, they appear to see change as being too rapid and desire more stability.

The post shock group also exhibited a greater degree of familism and appear to have strengthened the interactive bonds of the family during the time the community was restructuring.

Basically, it was found that water resource development did not result in negative attitudes toward the changed community or the social relationships of the community group. The study supports the position that watershed development in the form of a large impoundment project did not result in a fragmented social unit, but in fact may have served to enhance the social cohesiveness of the unit. This finding is consistent with previous research by Napier (1971, 1972, 1974) and Wright (1972) and Napier and Wright (1974). The previous research demonstrated that community groups disrupted by large development projects necessitating land acquisition and forced relocation did not result in the emergence of negative attitudes toward the community. Negative attitudes were directed in all cases toward the source of the disruption (the land acquisition process and the development project).

A possible explanation for the emergence of more positive attitudes toward the community may be a collective response to an outside threat which would tend to draw people together. In fact, a community group was formed to oppose further recreational development of the lake.

The resolution of uncertainties over the project's effect upon the community would also contribute to the emergence of more positive attitudes toward the community.

It may be argued that outmigration of dissatisfied people may have contributed to more positive attitudes. However, the relocated people who were included in the sample were not significantly different from the initial shock sample of relocated people (with the exception of familism). Had the post shock relocated group been much more positive than the initial shock relocated group on all variables then the possibility of selective outmigration of unhappy people would have more support. The data suggest that the nonrelocated group was the greatest source of the changing attitudes, since the post shock nonrelocated group differed significantly from the initial shock nonrelocated group on all variables.

Limitations

The relatively high percentage of relocated people who resettled outside of the community was not anticipated. Previous studies (Napier, 1971; Wright, 1972) indicated that relocated people generally attempted to resettle within the same community. The small relocated portion of the sample limits the generalizability of the findings for relocated people. However, as was noted above, the initial shock relocated group was not significantly different from the post shock relocated group with regard to the attitudinal variables analyzed.

An uncontrolled factor that affected the research was a controversial proposal for further acquisition of land for recreational purposes. A community organization was formed to oppose the additional land acquisition, construction of a proposed state lodge, and what would be a second relocation for some community residents. To date the opposition has been successful in preventing establishment of the recreational facility. This intervening controversy may have affected the restructuring of the community group and formation of attitudes toward the changing community.

APPENDIX I

Range of Possible Scale Scores for Selected Attitudinal Scales (Number of Scale Items in Parentheses)

Scale	Range of Scores		Median Possible Scale Score
Community Alienation (20)	20-100	high alienation	60
Community Identification (12)	12- 60	high identification	36
Community Satisfaction (6)	6- 30	high satisfaction	18
Value Orientation (7)	7- 35	high traditionalism	21
Familism (9)	9- 45	high familism	27

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